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national accelerator laboratory

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Subject

EXPERIMENTAL BUILDING COSTS

This note concerns an analysis of the costs associated with the construction of a major experimental building at Brookhaven. Since similar buildings will be needed at the new accelerator, an examination of the features of this building will provide information helpful for experimental planning at NAL.

The building is 160 feet wide and 350 feet long enclosing 54,000 square feet of usable space. It is serviced by a 40 ton crane riding on elevated rails with a clear space under the bridge of 28.5 feet to the floor. Ten megawatts of electrical power will be distributed around the periphery of the building, and cooling water of similar capacity will be piped into man-sized trenches. Lateral trenches across the building will distribute the electrical and mechanical services to the vicinity of the experimental set-up. The building is equipped with all the usual telephone, fire, and control circuits. The only special feature is the installation of high velocity exhaust fans in the roof to vent the building in case of an accidental spill of a hazardous material such as liquid hydrogen.

The building is nearly completed, and it is expected to cost 2.45

million dollars, or $\$45/ft^2$. The construction of this building did not require unusual site preparation, and the utilities were not located far from the construction site. A cost of $\$50/ft^2$ could easily result from the building being constructed in some remote location.

The major categories of building costs distributed by percent of total cost are:

Basic Building	% of total cost
Clearing land, excavation and site preparation	3.2
Substructures	11.0
Superstructures (exclusive of crane & supports)	23.0
Crane, Supports and installation	9.1
Building services - mechanical	6.9
Building services - electrical	4.3
Sub total	57.5%
Equipping Building for Experimental Use	
Experimental Power	18.8
Experimental Cooling Water	7.9
Hydrogen Protection	6.8
Misc. Control Equipment	9.0
Sub total	42.5%

It can be seen from this analysis that the incremental building costs for crane coverage are less than 10% of the total cost.

Background material and work sheets for this analysis have been left with A. L. Read.